

U.S. Fish & Wildlife Service  
National Park Service

## OWL SURVEY – 2014, LAKE CAMP TO KING SALMON, ALASKA

Sherri Anderson<sup>1</sup> and Susan Savage<sup>2</sup>

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March 2015



<sup>1</sup>National Park Service  
Katmai National Park & Preserve  
PO Box 7  
King Salmon, AK 99613

<sup>2</sup>U.S. Fish and Wildlife Service  
Alaska Peninsula / Becharof National Wildlife Refuge  
PO Box 277  
King Salmon, AK 99613

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**KEY WORDS:** *Aegolius acadicus*; *Aegolius funereus*; Alaska Peninsula; boreal owl; *Bubo scandiacus*; *Bubo virginianus*; great horned owl; Katmai National Park; northern saw-whet owl; owl surveys; point transect surveys

Cover Photo of a juvenile Boreal Owl taken near King Salmon, Alaska (photo by Rod Cyr).

**Suggested Citation:**

Anderson, S. and S.E. Savage. 2015. Owl Survey – 2014, Lake Camp to King Salmon, Alaska. USFWS, Alaska Peninsula/Becharof NWR Report, King Salmon, Alaska.

## Introduction

In discussions of monitoring and conservation actions for priority avian species and species groups on the northern Alaska Peninsula, owls were determined to be a group for which there was little information. For minimal effort or cost, it is possible to monitor owls in the local area at a time when other field work priorities are not pressing. Savage conducted one owl survey along the Lake Camp Road in 2000; then in 2012 we conducted our first pilot study (Savage and Anderson 2013) using recommendations from the Canadian Guidelines (Takats et al. 2001) and Alaskan Owl Survey (Andres 2001). The 2012 pilot study included listening only at 12 point counts. In 2013, we modified our route and our protocol based on recommendations from our 2012 work and incorporated methods from Kissling et al. (2010) to include 10 point counts with listening and playback recordings (Savage and Anderson 2014). The same route and protocol were followed this year.

## Study Area

King Salmon, home to the offices of Katmai National Park & Preserve and the Alaska Peninsula/Becharof National Wildlife Refuge, lies to the west of Naknek Lake and along the Naknek River. A well-developed terminal moraine confines the lake and a gravel road extends from King Salmon to Lake Camp, the only road accessible location in Katmai National Park. From Lake Camp, the road crosses the moraine, and then traverses a flat outwash plane to the west. The vegetation is strongly influenced by climatic factors. The area experiences a Bering Sea influenced maritime climate including wet winters and cloudy, cool summers. Wind storms are common. King Salmon and the southwestern Katmai boundary define the southern edge of the boreal forest. In the area white and black spruce are fairly stunted and are intermixed with cottonwood and birch forest (Figure 1). Common vegetation includes willow and alder shrub lands, especially in riparian areas or on slopes respectively, ericaceous dwarf shrub and graminoid meadows, and sedge dominated wetlands. We attempted to focus the survey route in the boreal forest.

## Methods

- Survey window was 15 Feb – 15 May.
- Survey timing was set to one hour after sunset (sunset calculations from: <http://www.sunrisesunset.com/calendar.asp> for zip code 99613 – King Salmon, Alaska)
- Acceptable survey conditions are: DO NOT conduct survey if precipitation is more than light drizzle or moderate snow, winds exceed Beaufort scale 3 (>12 mph), or temperature is lower than -20°F (-29°C) (Andres 2001). Note general conditions at the beginning of the survey: Moon phase (in quarters), snow depth and coverage. Note conditions on form at each stop including: cloud cover, moon visible, temperature, wind speed.
- Survey route (see Figure 1) included 10 stops. Stops are approximately a mile apart. Due to bald eagle nest initiation near the end of the oxbow, we adjusted the location of Stop 8 in 2013 mid-season (marked 8.5 on map). A GPS was programed before the surveys with the stop locations and used during the surveys for navigation.



**Figure 1.** Survey point locations for the 2014 Surveys, Lake Camp to King Salmon, Alaska.

- Survey procedure was as follows: listen at each stop for 5 minutes (broken into a 3 minute and then 2 min interval) to detect owls. Then deploy playback. Playback consisted of: 30 sec northern saw-whet owl (*Aegolius acadicus*; NSWOW), 1 min silent, 30 sec NSWOW, 2 min silent, 30 sec boreal owl (*Aegolius funereus*; BOOW), 1 min silent, 30 sec BOOW, and 2 min silent. Observers stand close to each other so they hear the same information, but so they do not key in on each other's observations (standing back to back is one option). Estimate distance to each calling owl and make note of direction of the calling bird to avoid counting the same owl at another stop. Indicate (with an asterisk) individuals that are heard at multiple stops. Record numbers of vehicle passes (car, truck, snow machine, air plane) while at each stop (code as AUTO), if there are noises preventing owls from being heard, score question as yes. If there are other noises of interest, record in Notes. Year 1: Navigate using GPS points to predetermined stops. If

predetermined stops are off the road, collect new waypoints. Make a stop outline that gives good description of the stops (e.g., near power pole #12) and plot all stops along the route on a map. Subsequent years: Follow the new GPS waypoints to return to the same stops. We used a Foxpro NX3 for playbacks. The audio clips came from Peyton (1996) and were formatted using Nero wave editor to create the string of species vocalizations and silent periods.

- Survey Repetition: The goal was to run the routes at least every two weeks. One survey goal is to determine the peak timing for each species. It would also be desirable to survey the same route at different times during the same evening or on different evenings of the same week (i.e. trying to keep moon phases, etc. fairly constant with time of night being the variable). Use of the same observer for surveys repeated during the same, and multiple, seasons, is encouraged.
- Survey Results: Data is keyed into an Excel Spread Sheet with “related” worksheets. Worksheet structure is found in Savage and Anderson (2014) Appendix I
- Survey form: See Andres (2001).
- Equipment: See list in Savage and Anderson (2014) Appendix II.

## Results

Five surveys were completed starting 1 March and ending 15 May 2014. The stops of the route are found in Table 1 and on Figures 1 and 2. We visited stop 8.5 this year instead of stop 8 because the status of the bald eagle nest near Stop 8 was unknown at the initiation of the 2014 survey. The following are descriptions of each survey’s details and results.

1 March 2014:

Savage determined that conditions were favorable for a survey; Anderson was away. Savage recruited Bob Blush to participate. The survey began at 1955 (Alaska Standard Time: sunset at 1854); start temperature was 2°C, new moon, with no snow cover. Winds were none (Beaufort scaled 0). Surveyors completed stop 10 by 2332 with temperature dropping to -5°C. Savage and Blush detected a great horned owl (*Bubo virginianus*, GHOW) at stops 2, 3, 5, and stop 8. Savage also heard a great horned owl at stops 6 and 7 (Table 2). Owls were heard during multiple listening blocks (i.e., some during the 3 minute interval, some in the 2 minute interval, etc.).

24 March 2014:

We determined conditions were favorable and both authors were available. The survey began at Lake Camp at 2146 (Daylight Savings Time [DST]: sunset at 2048) and was completed on 25 March at 0114. Conditions remained favorable with start and end temperatures being -2 to -3.2°C respectively, snow cover was patchy, skies clear, and no winds (Beaufort scaled 0). There was a new moon. Anderson heard one GHOW at stop 5.

Table 1. Waypoints and Stop descriptions for Owl Survey Points, Owl Survey – 2014, Lake Camp to King Salmon, Alaska.

Owl_PT	BBS PT/ Way Pt	Latitude	Longitude	Vegetation	Description
OWL01	BBS01	58.67252	-156.45901	Tall and low shrub thicket and deciduous forest along Naknek River (115 m)	Lake Camp parking lot, upper lot near picnic area
OWL02	near BBS03	58.67793	-156.48499	Coniferous and deciduous woodland interspersed with tall shrub thicket, lake 150 m distant	near lower Pike Lake (L)
OWL03	near BBS06	58.67273	-156.51521	Deciduous forest interspersed with coniferous woodland and tall shrub ticket, lake 160 m distant	Upper Pike Lake to left
OWL04	BBS09	58.66462	-156.54659	Coniferous woodland on edge of gravel pit, deciduous forest interspersed.	near gravel spoils, past last gravel pit (L)
OWL05	near BBS11	58.66284	-156.57194	Tall shrub thicket with deciduous and coniferous/lichen, low shrub interspersed	intersection Lake Camp/Rapids Camp road
OWL06	BBS13	58.65009	-156.56502	Tall shrub thicket to west and mesic meadow, coniferous woodland to the east.	open woodland along Rapids Camp road
OWL07	n/a	58.63550	-156.57147	Coniferous woodland with deciduous forest and tall shrub interspersed, Naknek River 170 m to SE and 190 m to W.	N end of Rainbow Bend Rd near Manojkee Driveway
OWL08	n/a	58.61867	-156.57399	Deciduous forest block adjacent to coniferous woodland. End of peninsula with water on three sides, closest 100 m.	S end of Rainbow Bend Rd at turn around
OWL08.5	n/a	58.62103	-156.56874	Low shrub thicket with deciduous forest to the SW. Naknek River 200 m SE and 210 m NW.	400 m. short of OWL08 due to incubating BAEA nest
OWL09	BBS17	58.67567	-156.60675	Coniferous woodland with mesic graminoid meadow, deciduous forest and tall shrub interspersed.	Return to Lake Camp Road, ~ 1 mile past intersection toward King Salmon; open woodland
OWL10	near BBS20	58.67759	-156.63087	Coniferous woodland interspersed with deciduous woodland and tall shrub. Human disturbed areas nearby.	Closed spruce forest past Doppler Radar Dr. near driveway to R

### 30 April 2014

We determined conditions were favorable and both authors were available. We started the survey at 2311 (DST; sunset at 2213) and ended on 1 May 2014 at 0244. Temperatures at the start and end were 2 and -3°C respectively. The moon was new, there was no wind (Beaufort scaled 0), and no snow cover. At stop 1 Savage heard three and Anderson heard one GHOW. At stop 2 Savage heard one GHOW and Anderson heard one GHOW and one Northern Saw-whet Owl (*Aegolius acadicus* NSWO). At stop 6 Savage heard two GHOW and Anderson heard one GHOW. At stop 9 Savage and Anderson heard one GHOW and one NSWO. Both Savage and Anderson hear two GHOW at stop 10. Owls were heard during multiple listening blocks

### 12 May 2014:

Anderson determined conditions were favorable and recruited Biological Technician Leslie Skora to fill in for Savage as she was unavailable. The survey began at 2336 (DST; sunset at 2241) and was completed on 13 May at 0227. Conditions remained favorable with start temperatures of 5.6°C and end temperature of 0.6°C. There was no snow cover, clear skies, and no to light winds (Beaufort scaled 0 – 2). We detected the full moon on all stops. Anderson detected one GHOW at stop 1. Both Skora and Anderson detected one GHOW and during the S1

block two BOOW were recorded that reacted to playbacks at stop 2. Both observers detected one GHOW at stop 4. Anderson detected a GHOW at stop 5. At stop 9 Anderson detected two BOOW and Skora detected one. At Stop 10 both observers detected a BOOW and Anderson detected a GHOW. Owls were heard during multiple listening blocks.

Table 2. Owl detections by survey date, observer, species detected and time block detected, Owl Survey – 2014, Lake Camp to King Salmon, Alaska. When individual owls were heard in multiple listening blocks, only the listening block of the first detection is tallied. Grayed cells indicate the absence of that observer on that date.

	Survey Date	1-Mar	24-Mar	30-Apr		12-May		15-May
Species Detected	Listening Block (min)	GHOW	GHOW	GHOW	NSWO	GHOW	BOOW	Any Owl
Observer								
Anderson	0-3		1	4		1		
	3-5			2				
	S1				1	1	2	
	S2			2	1	1		
	B1			1				
	B2					1	3	
Savage	0-3	5		6				
	3-5							
	S1			2				
	S2			1	1			
	B1			1				
	B2	1						
Other Observer	0-3	3				1		
	3-5					1		
	S1						1	
	S2							
	B1	1					2	
	B2						2	

15 May 2014:

Savage determined conditions were favorable, but Anderson was not available; Savage employed her seasonal staff including Biological technician Jaime Welfelt and Interns Jessica Howell, Jake.Looze, Carrick Rice, and Sarah Wartman. While Savage was the primary observer at each stop, each seasonal observed during two stops. Observations began at 2325 (DST; sunset at 2247) and were completed on 16 May at 0224. Conditions remained favorable with start temperatures of 7.2°C and end temperature of 2.7°C, no snow cover, clear skies, and no to light

winds (Beaufort scaled 0 – 2). A full moon was visible at all sites. No owls were heard during the survey.

In summary, GHOWs had the most detections and were detected on four out of the five surveys. Counting the maximum number of owls detected per point per survey by either observer we averaged about 5.8 owls (range 1 – 12) per survey. The greatest number of individuals and species were detected on the 30 April survey. Boreal owls were detected on just one survey (12 May); NSWOWs were detected on only one survey (30 April). Over the course of the five surveys an owl was detected on every stop; GHOWs were detected on four surveys at stop number 5 and at stops 1, 2, 6, and 10 during two surveys. GHOWs were usually detected during the first three minutes of silent listening, the northern saw-whet were detected during the S1 or S2 listening block and the BOOWs were heard during the S1, B1 and B2 listening period, with both species calling after the playbacks. Savage and Anderson detected more owls than the other observers on most surveys, and owls were not always detected at the same stops by both observers.

## Discussion

We were not able to implement any recommendations from Savage and Anderson (2013) therefore, the recommendations from that report stand for future investigation of owls in the King Salmon vicinity. We developed a testing playback but were unable to schedule a date for testing. Although we had a larger pool of observers many were on travel through the survey window and as in previous years, it was difficult to schedule surveys. Due to poor survey conditions it was difficult to perform many surveys so no tries were attempted at multiple surveys on a given night. As in 2013 in addition to the great horned owl, we detected two other species of interest: boreal owl and northern saw-whet owl. The two species were detected after the playback calls which aligns with the findings of Kissling et al. (2010, Beaucher and Dulisse (2004) and Whittam 2001 which used playback calls to detect northern saw-whet or boreal owls.

Our main goal was to document the presence and time of arrival of boreal owl and northern saw-whet owls that are known to be at least seasonally present in the area, but are rarely detected. See Savage and Anderson (2013) for a brief overview of the incidental information available about owls in the King Salmon area. Updated phenology data (Savage, unpublished data) indicated no change to this range of dates for boreal owl (earliest first detection for any year being 18 January in 2010 and the latest first detection on 17 April in 2009); this year's first detection by Rod Cyr was 6 March. Our only detection during the 12 May survey falls well beyond this date. This year's survey had the highest number of BOOW detections compared to past surveys. Northern saw-whet owls are rarely detected; we detected NSWOW during this survey both in 2013 (10 May) and 2014 (30 April). The earliest incidental record is 4 February (2004). Kissling et al. (2010) found northern saw-whet owl peak in the Juneau area to be during the 9 April to 8 May survey period.

Differences between observer detections occurred again this year. Observers were asked to compare their observations after the final listening period at each stop to see if they could come to some consensus on the direction of each bird detected (recommendation from S. Lewis,

personal communication). Observers concurred on 13 observations (allowing a directional difference of up to 30 degrees). On another three birds that were potentially the same, observer directions were different by more than 30 degrees, and on three more potentially same observations, one observer did not record direction. For ten observations, only one observer recorded a bird. This totaled to 29 or more (if observations assumed to be the same were different) observations. As seen in previous years, most of the owls seemed to be distant (>300 m) it was often difficult to locate their direction and impossible to measure distance without additional training and practice.

Due to frequent windy weather in the winter and non-field oriented obligations for the authors, meeting a two week survey interval goal proved difficult. Daily average wind exceeded the Beaufort 3 level on 22 out of 90 possible survey days (Weather Underground 2014). Field experience dictated that wind of even Beaufort level 3 impeded detection; King Salmon winds averaged Beaufort level three on an additional 25 days<sup>1</sup>. On another seven days that did not average these wind speeds, King Salmon received daily precipitation of more than >0.01" for a total of 54 days unavailable due to weather. In addition to weather challenges, non-field obligations (including regional avian coordination meetings) demand the authors to be away from King Salmon during the winter. These factors are unlikely to change so scheduling surveys will continue to be a challenge.

The National Audubon Society Climate Change Report (2014) states that 0% of the current boreal owl range is stable and that total winter range will decrease by 51% by the year 2080. Audubon also states that only 1% of the current winter range is stable for the northern saw-whet owl for the same time frame and this species faces a 94% decrease in winter range over the same time period. Audubon does qualify their conclusions for northern saw-whet owl because the current data, based on daytime surveys, is not sufficient to adequately model species range. The North American Bird Conservation Initiative (2014) continues to promote outcome-based monitoring as one of many tools to support healthy bird populations. New monitoring efforts in Alaska include partnering between the Alaska Department of Fish and Game and Mount St Joseph College in Miami Florida to renew a boreal owl study in Fairbanks, Alaska (2013). A statewide coordinator is needed to lead the effort of codifying protocols, accumulating data and providing analysis as exists in Canada or for the similar volunteer effort of the Breeding Bird survey.

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<sup>1</sup> <http://www.wunderground.com/cgi-bin/findweather/getForecast?query=99613>

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	3-5							
	S1			2				
	S2			1	1			
	B1			1				
	B2	1						
Other Observer	0-3	3				1		
	3-5					1		
	S1						1	
	S2							
	B1	1					2	
	B2						2	

## Acknowledgements

Thanks to Katmai National Park staff members Leslie Skora and Alaska Peninsula/Becharof NWR Biological Technician Jaime Welfelt and volunteers Robert Blush, Jake Looze, Jessica Howell, Sarah Warman and Carrick Rice for staying up late in the cold to help with a survey. Liz Julian assisted with the creation of the sound clip for the playback device. Both Katmai National Park and Alaska Peninsula/Becharof National Wildlife Refuge provided vehicles and gasoline to complete the surveys.

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